

NEWLY ADDED CLAIMS

12. (New) A compound-layered-type-sensing-device, comprising:
- first and second solid electrolyte plates;
- first and second chambers, each formed between the first and second solid electrolyte plates, into which a gas to be measured is introduced respectively, the first chamber being connected to an outside of the device via a first diffusive resistance passage and the second chamber being connected to the first chamber via a second diffusive resistance passage;
- first and second reference gas chambers into which a reference gas is introduced respectively, the first reference gas chamber being formed on one side of the first solid electrolyte plate opposite to the first and second chambers, and the second reference gas chamber being formed on one side of the second solid electrolyte plate opposite to the first and second chambers;
- a first pair of electrodes comprising a pumping electrode and a reference pumping electrode to form a first electrochemical cell together with the second solid electrolyte plate, wherein the pumping electrode is located on the second solid electrolyte plate to be exposed to the first chamber and the reference pumping electrode is located to be exposed to the second reference gas chamber, whereby the first electrochemical cell pumps oxygen corresponding to an amount of voltage applied to the electrodes of the first electrochemical cell;

a second pair of electrodes comprising a sensing electrode and a reference sensing electrode to form a second electrochemical cell together with the first solid electrolyte plate, wherein the sensing electrode is located on the first solid electrolyte plate to be exposed to the second chamber and the reference sensing electrode is located to be exposed to the first reference gas chamber, whereby the second electrochemical cell produces current corresponding to a concentration of a particular gas component of the gas to be measured by applying a given amount of voltage to the electrodes of the second electrochemical cell; and

a third pair of electrodes comprising an oxygen sensing electrode and a reference oxygen sensing electrode to form a third electrochemical cell together with the first solid electrolyte plate, wherein the oxygen sensing electrode is located on a given surface of the first solid electrolyte plate to communicate with an outside of the device and the reference oxygen sensing electrode is located on the given surface of the first solid electrolyte plate to be exposed to the first reference gas chamber, whereby the third electrochemical cell measures oxygen of the gas to be measured between the electrodes thereof.

13. (New) The sensing device of claim 1, further comprising a heater disposed to provide the solid electrolyte plates with heat, wherein the second electrochemical cell is positionally more distant from the heater than the first electrochemical cell.